

segments of the calyx lanceolate-oblong; corolla large, white; capsules broad-obcordate, slightly compressed, glabrous; seeds compressed-ovate, brown, wrinkled.

On barren ridges along the Coorong, and on limestone rocks around Lake Alexandrina.

LENTIBULARINÆ.

50. *Polypompholyx exigua*.

Urticles ovate; leaves narrow-lanceolate or oblong, tapering into the petiole; scape filiform, one-three-flowered; corolla rose-red; lower lip nearly horizontal, trifid, at least three times longer than the upper lip, its segments oblong-linear, blunt, the middle one larger, the lateral ones hardly longer than the spur; upper lip nearly erect, bipartit, with linear subulate divisions; palate yellow, with an orange margin.

In mossy, peaty or boggy places at the Grampians, Serra and Victoria ranges, and in South Australia at Echunga.

It differs from *Polypompholya tenella*, besides in the characters pointed out already, in its larger flowers.

ART. V.—*Personal Observations made in an Excursion towards the Central Parts of Victoria, including Mount Macedon, McIvor, and Black Ranges.* By WILLIAM BLANDOWSKI, ESQ.

THE Victorian Government having conferred on me the honour of assisting in the formation of a museum of Natural History, and of reporting upon the physical character of those parts which, in the execution of that mission, I should happen to visit, I accordingly selected for the scenes of my early labours that portion of the country including within its area, Mount Macedon (40 miles north of Melbourne), McIvor (30 miles north of Mount Macedon), and the Black Ranges, on the upper Goulburn River, 40 miles eastward of McIvor. I have now the honour to lay before the Philosophical Society, the principal results of my observations during the three months devoted to this interesting object, having reduced them under the following distinct heads:—

- I. The physical character of the midland portions of the country; with a review of the general capabilities of its surface.

- II. The Geology, Mineralogy, Paleontology and } of those
 III. Zoology } districts.
 IV. The Aborigines; their manners, habits, and customs.

I. The general character of the country in the neighbourhood of Melbourne, and between that city and Mount Macedon, is flat and open, comprising a series of extensive plains. They are intersected in every direction by the Yarra and Saltwater rivers, Jackson's and the Deep Creeks, whose beds, running through in steep gullies, are remarkable for their great depth, averaging about 150 feet. The banks of these streams are adorned more or less by avenues of thick she-oak (*Casuarina quadravalvis*) and he-oak (*C. leptoclada*). A belt of clay slate, commencing about half way between Melbourne and the Mount, forms a semicircle around the latter on the south and eastern sides. The soil of those districts which are comprised in that circuit is much inferior to that of localities favoured by the more fruitful basalt formation, which is very extensively developed around Mount Macedon, its rich agricultural qualities rendering that district particularly encouraging to the farmer. The only circumstance at all detrimental, is the great elevation of the land above the sea level, which exposes it to the influence of the cold; ice sometimes forming, of the thickness of half an inch.

The ranges known as Mount Macedon itself, are covered with an exceedingly rich soil, except perhaps one portion which makes a semicircular sweep towards Alexander's Head, consisting for the most part of quartzzy slate, and enclosing the granite of the south and eastern portions of the chain. Mount Macedon is a lofty and picturesque peak, its sides clothed with forests of gigantic eucalypti; the gullies and ravines which everywhere intersect it, being alike overrun with immense fern trees (*Dicksonia antarctica*), so dense as to present an almost impassable barrier to the progress of animals.

About two miles from the mount, at the head of Five Mile Creek, is a remarkable hill called Diogenes' Mount, commonly known to the colonists as "Dryden's Monument," a name singularly inappropriate, being the cognomen of a settler in the neighbouring district. For a description of this highly interesting mount, I refer to a subsequent page, where full details concerning it will be found.

The dividing ranges between the Deep Creek and the Campaspe River consist of granite, covered with a sandy and unproductive soil. They rise to a considerable elevation, and

on their surface are many remarkable groups of granite boulders ; the soil between these, resulting from the decomposition of the basalt, being of an exceedingly rich quality. The two localities last mentioned, viz. the dividing ranges and Dryden's Monument, for the interest of their geological conformation and the extreme beauty of their scenery, are almost unequalled throughout Victoria ; and offer to the inhabitants of the city, a quiet and instructive retreat for the employment of their leisure hours.

Crossing these ranges the traveller merges into the Murray district. Once arrived on the plains, a milder climate than that of the more southern portions of the country, is distinctly experienced. These elevated plains belong more or less to the basalt formation, and from the fertility of the soil, especially in particular places, (as in the neighbourhood of Dr. Baynton's station,) as well as good water, a fine climate, gently undulating ground, and most beautiful scenery, are highly deserving the attention of the future settler.

North of the Mie Mie Inn, famous as being the spot where the celebrated gold escort robbery took place, the soil is cold and unproductive ; but towards Patterson's station expands into open and fertile plains, entirely free from stones and boulders.

Arrived at the McIvor diggings, the only particular object of interest, is the track marked out by Sir T. Mitchell, in the first exploring expedition ever undertaken through Australia Felix.

The surface of the country north of McIvor, is both clayey and rocky ; is densely timbered and abounds with precipitous ravines, being thus available only for pastoral pursuits.

Between Lancefield and Kilmore the road leads over an elevated plateau formed of basalt strata. The face of the country is here extremely rocky, and unfit for cultivation ; but in the neighbourhood of the latter township its character changes, and rich alluvial land gratifies the eye of the observer. Kilmore is fast becoming the centralizing point of an important agricultural district, and is already the largest inland town in the whole colony.

Eastward of the line of road leading from Kilmore to Seymour, is seen the singular peak known to the colonists as Ferguson's "sugar loaf" which possesses a considerable degree of interest on account of its remarkable conformation and appearance. The rich character of the land around this peak is well known to the settlers, but owing to its elevated position, it is, like the plateaux of Mount Macedon, much exposed to the injurious influence of the cold.

On arriving at Seymour (lat. 37°) the bald granite hills of the black ranges become visible on the eastern horizon. The latitude is the characteristic weather line of our meteorological phenomena, which is especially manifest in the advanced state of vegetation north of that parallel. This, I imagine, is chiefly owing to the influence exerted by the different adjoining ranges, viz. Mounts Benson and Gambier, the Grampians, the Pyrenees, Victoria, Alexander and Kilmore ranges, which all lie under the same latitude, and present an effectual barrier to the cold south wind, thus rendering the vegetation to the north of them fully four weeks in advance.

Approaching Seymour I was delighted to behold the magnificent river, the Goulburn, upon whose banks it is situate; its sides adorned with rows of shady wattle (*Acacia molissima*) and lofty gum trees. I am convinced that by the removal of but few obstructions, steam communication could be easily effected between that river and the Murray Settlements.

The highest point of the Black Ranges is formed of granite. The view from certain points of this hill is grand and imposing; at its foot is seen the Goulburn hastening into the Murray, after traversing a vast tract of dark forest land extending as far as the eye can reach, and clothing with the deep and sombre hue of the eucalyptus the sides of the lofty Alps, whose glistening summits are crowned with snow.

The southern slopes of the Black Ranges are exceedingly steep, so much so, that finding it impossible to proceed with a dray in that direction, I was compelled to retrace my steps and pursue a different route.

The right bank of the Goulburn, on that side opposite to the Black Ranges, is both rugged and mountainous; it is densely covered with thick forest, and will for centuries be of use only as pasture ground. Now and then, however a rich gully occurs; but these are exposed to counterbalancing drawbacks, being subject in winter to sudden and heavy floods, scooping out ravines in the alluvial soil, of considerable extent and depth. In May and June, the months in which the cold sets in, the higher ranges become, during the night, covered with snow, which however disappears with the warmth of the morning sun. The scenery of these mountains reminds one of the rugged passes of Switzerland or the Rhine, and the hospitality which characterizes the inhabitants of mountainous districts in every part of the world, is fully borne out by the settlers of the Goulburn,

who are proverbially the best riders in the country, and surpass anything we read of concerning the horsemanship of other countries; this superiority being attributable only to the rugged nature of the district in which they reside.

II. Melbourne, as is well known, rests on strongly compressed silurian strata, entirely surrounded by the basalt formation. Extremely minute fossils (*Atrypa*) are found in these strata; but those tyrolites obtained near Flemington, scarcely two miles from Melbourne, and of which I have procured living specimens from Western Port Bay, are large and perfect. The latter are petrified in brown iron ore belonging to the uppermost tertiary formation.

The extensive plains between Melbourne and Mount Macedon, as has been stated in the former part of this paper, belong almost entirely to the basalt, or, as some English geologists term it, the trap formation. The rocks of this class are composed principally of felspar and augite, the latter predominating; and a soil of very superior capabilities arises from their decomposition.

The trap rocks which occur throughout Victoria, I have arranged under two distinct heads, viz., basalt proper, and dolerite; the former a black homogeneous mass, sometimes impregnated with different zeolites and iron ore. That both are the result of volcanic action there cannot be the slightest doubt, as they exhibit the most unmistakable signs of having been once in a molten state.

The different varieties of basalt which occur in the plains above mentioned are:—

1. Common basalt or bluestone; in columnar platforms and irregular boulders.
2. Porous basalt in irregular forms; on account of its porosity unfit for building purposes.
3. Pumice stone, like basalt. Swims in water; attracts and retains the heat very powerfully.
4. A lithomous mass of an ochre-brown colour; easily crumbled. It is questionable whether it be not of aqueous origin, its formation taking place when the volcanic power was finally subdued.
5. Black soil of a crumbling nature. The decomposition of this species produces a soil highly valued for agricultural purposes. When mixed with clay the ground becoming what is termed by the colonists "honey-combed;" and if stones be intermingled with it, mounds are raised, designated "dead men's graves."

Eastward from Alexander's Head, on the Deep Creek, is a gully containing groups of basaltic columns of considerable interest. They are from fifteen to twenty feet in height, and about one foot apart; the bases very convex, but at the summits concave. Below these columns is a stratum of porous basalt a few feet in thickness; and beneath this another extremely porous, and perforated with large irregular holes, whose edges are rounded by the action of internal fire. The whole rests on a stratum of basalt conglomerate.

The low ranges east of Mount Macedon are composed of quartz, and though similar in character to the Cambrian formation, are apparently devoid of fossil remains.

Near Fawkner's old station is a bald hill formed of dolerite boulders, from 2 to 10 feet in diameter and about the same height, cropping out from the smooth surface, and investing the hill with a rugged appearance.

The fine grained granite which forms the summits of the Mount Macedon chain, exhibits a strong inclination to shelve off in horizontal layers. The felspar which enters into the composition of this granite bears a very large proportion to the quartz, the black mica is distinct and characteristic.

I could nowhere detect any indications of precious stones on these ranges, which are very scantily covered with a thin coating of alluvial soil.

Some distance N.E. from the peak of Alexander's Head, is the spot where the discovery of bones of gigantic antediluvian fossil birds took place, 5 or 6 years since, in a basaltic cavern. I was much disappointed at my ineffectual endeavours to obtain similar specimens, in consequence of my inability to suppress the springs of water sufficiently to enable me to reach the proper depth.

Two species of granite occur on the dividing ranges between the tributaries of the Deep Creek and the Murray River. The first is composed of coarse crystallized felspar, oligoclase and albite, with a little mica and quartz. This granite is found in shapes somewhat similar to ladies' thimbles; varying from two to one hundred feet in height, and from ten to three hundred feet in circumference. The fantastic arrangement of these groups is calculated to afford a constant theme of speculation as to the original cause which produced it, amongst those whose fancies lead them to the consideration of such things. On Perry's run I saw a boulder of an enormous size resting on a base of scarcely twenty square feet. So remarkable an occurrence deserves to be re-

corded amongst those geological wonders which in different countries have so frequently excited the curiosity of even the most thoughtless of mankind. There is also a very interesting group of boulders on Dr. Baynton's run.

The second species of granite on the dividing ranges, consists of fine crystallized felspar, with a small admixture of mica and quartz, the latter in minute particles. This granite constitutes the higher ranges on Mollison's run, and appears similar to that at Mount Macedon; it exhibits a strong tendency to split perpendicularly.

The celebrated spot which supplies the natives with stone (phonolite) for their tomahawks, and of which I had been informed by the tribes 400 miles distant, I was unable, at this period of my journey to trace out; but subsequently was fortunate enough to hit upon it accidentally while in search of other objects, with the assistance of F. Mackenzie, Esq.

Three miles east of Lancefield is a lofty chain of hills, running nearly north and south; the highest summit of which is called Mount William. These ranges are intersected by the road leading from Lancefield to Kilmore, and which divides the basaltic strata, on the north from the clay slate rocks and slate of the southern portion of the range. The basalt gradually changes its specific character, northward, till at Mount William it becomes distinct phonolite, of a hard and glassy texture. A most excellent stone for macadamizing roads occurs in this locality, and will be a treasure to the neighbouring district, when the progress of the country shall demand its application. Good brown iron ore also occasionally occurs, though not in great quantities.

Having observed on the tops of these hills a multitude of fragments of stones which appeared to have been broken artificially, and which I recognised as phonolite or clinkstone, I was led to trace them to the source from which they appeared to have proceeded, a spot three-quarters of a mile eastward, on somewhat lower ranges. Here I unexpectedly found the deserted quarries (kinohalm) of the aboriginals, which I had previously been unable to discover. The phonolite (tadijem), as before mentioned, is that of which their tomahawks are formed. The quarries which extend over an area of upwards of 100 acres, present an appearance somewhat similar to that of a deserted gold field, and convey a faithful idea of the great determination displayed by the aboriginals, prior to the intrusion of the white races. They

are situated midway between the territories of two friendly tribes,—the Mount Macedon and Goulburn,—who are too weak to resist the invasion of the more powerful tribes; many of whom, I was informed, travel hither several hundreds of miles in quest of this invaluable rock. The hostile intruders, however, acknowledge and respect the rights of the owners, and always meet them in peace.

The phonolite is of great hardness, and is distinguished from basalt by its greater specific gravity, its chemical composition being—silica, 67; alumina, 18; natrium, 7; calcium, 7. The surface of the stratum is very rugged, and of a greenish colour. It is rather difficult of fracture; otherwise it is well adapted for metalling roads.

The basalt formation extends about four miles westwards of Lancefield, but is then interrupted by slate and milky quartz, strongly indicative of auriferous strata. Still further westward these are succeeded by dolerite, which extends over Alexander's Head, Mount Macedon, and Dryden's Monument.

Dryden's Monument is, as well on account of its geological character as its singular conformation, one of the most remarkable spots in Victoria, if not in whole Australia, and were a careful and minute description of it made, accompanied with good drawings, it would not fail to engage the attention of every geologist. The approach to it presents a scene of the most imposing grandeur. A massive wall of dolerite, whose deep and sombre hue is in exquisite harmony with the dark green of the eucalyptus, rises almost perpendicularly above the loftiest of the trees, and imparts a striking majesty to the whole view. The interest increases at every step approaching the monument, and a beautiful variety of rapidly changing scenery is unfolded like a panorama before the observer's eye. At the base about a thousand pyramidal columns, from fifteen to thirty feet in diameter, and thirty to one hundred feet in height, rise in bold relief from the surface, and invest the hill, which is about a mile in circumference, with an appearance not dissimilar to that of a gigantic porcupine, or to a colossal representation of the structure formed by the *termes bellicosus*.

That this hill was formed by subterraneous agency, acting at two separate periods, there can be little doubt. At the first era of its formation a naked semicircular hill was raised; and before sufficient time had elapsed to allow the surface to cool and harden, and while it was yet in a plastic state, a

second eruption took place, resulting in the production of the peculiar columns mentioned in the preceding paragraph. The origin of their formation reminded me of the phenomenon attendant on the refining of silver, as in both cases a discharge of gases must have taken place. The columns are solid, although they contain a considerable number of hollow concretions (septarians), from one to three feet in diameter, which are, however, filled up with *tripoli* or *steinmark*, a finely pulverised earthy deposit, of a greyish yellow colour, and a dry harsh texture. This *tripoli*, whose component parts are as follows:—silica, 80; alumina, 2; iron, 8; water 5; sulphurous acid, 5—is, I think, mostly derived from the decomposition of silica; it is very soft, and is much valued in other parts of the world, as a polishing material for hard metals and precious stones.

Many of the septarians are fractured or burst, and their internal structure thus exposed to view. I attribute these fractures to have originated from the following cause, viz., from the decomposition of the outer surface of the columns by the usual atmospheric action. The last laminæ being at length penetrated, the rains gained access through the fissures, and the expansive power of the *tripoli*, arising from the moisture, ultimately burst the septarians; and their contents, issuing from the opening, on to the rocks beneath, dotted them over with white spots, some of which are still observable, though the greater part of them are wholly erased by time. The soil between the columns, which are so numerous and thickly disposed as scarcely to allow a rider to pass between, arises from the decomposition of the dolerite, and is extremely rich. The physical conformation of Mount Macedon is identical with that of Diogenes' Mount, although the peculiarities of the former, which I have here endeavoured to describe, are not so marked, or so fully developed as the latter.

Between Dr. Baynton's and Mr. Perry's run, and the Mie Mie Inn, are extensive basaltic plains. Between Mr. Pohlman's and Mr. Perry's I found boulders of magnesite, about one foot in diameter, and similar in appearance to the stone which I had previously observed on Brock's run.

The steep banks of the Campaspe consist partly of basalt and of slate, with quartz scattered over the surface. Eastward of the Campaspe, from Dr. Baynton's to the Mie Mie Inn, the country exhibits every indication of being of an auriferous character.

A few miles south-east of Perry's home station, I came upon a stratum of a granitic character, about one chain broad; and, which is particularly worthy of notice, as it is a species of rock entirely new. The stones on the surface of this stratum are all more or less rounded, and quartz crystals are remarkable, forming regular dehexahedrons.

The whole of Perry's run eastward of the McIvor gold-fields is of an auriferous character. The stratification, which consists of slate alternating with quartz rock, is almost perpendicular, and pursues a gently undulating course, whose general run tends nearly north and south. At McIvor I observed boulders of dolerite of considerable size, and having a peculiar depression on their summits, extending across the auriferous strata.

From information which I received through the kindness of Mr. Chauncey, I was enabled to obtain chromium, antimony, chlorite slate, and a considerable number of petrifications, on the mountainous ranges to the north of Heathcote. The whole of the strata on these ranges (Mount Ida) consist of quartz rocks containing rhodicrinites. I am of opinion that it is the Cambrian, and not the upper Silurian formation, which is there represented; in support of which I refer to the following passage from Lyell:—

“Below the silurian strata in Great Britain is a vast thickness of stratified rocks, for the most part slaty and devoid of fossils. In some places a few organic remains are detected, but they are usually obscure, and whether the species will prove to be sufficiently distinct to entitle the rocks containing them to rank as an independent group, may be doubted. They attain a thickness of several hundred yards, and are chiefly formed of slaty sandstone and conglomerate, with brachiopoda and a few zoophytes.”

At the Mie Mie Inn, I met with a stratum of slate; and in attempting to ascertain its degree of cleavage, split it with perfect ease into thicknesses of pasteboard, whence its adaptability to the roofing of houses is at once obvious, and needs no comment. I have also seen it in slates of great size split naturally.

The Black Ranges consist of a compact globular mass of granite surrounded with slate. Imbedded in this granite is a fine felspathic stone, similar in character to that met with in the dolerite at the McIvor Gold Fields.

On certain points of this ridge, covered with sandy alluvial soil, are found specimens of smoky quartz and black-tourmaline (schörl) imbedded in kaoline or decomposed felspar.

The chemical constitution of the latter is aluminum 35, silica 48, and water 13; it is found in cavities twenty or twenty-five feet in diameter; and could be profitably turned to account in the manufacture of china glass. The smoky quartz is of great beauty, and besides being an ornament to museums, is valuable as an article of trade for jewellers' purposes. Hence it would be a profitable investment for the employment of labour; many valuable specimens could in a short time be procured by three or four workmen under good superintendence, and the principal expended (£200 would cover all) would be profitably returned by the sale of specimens.

The black tourmaline or schörl is interesting on account of the peculiar form in which it is crystallised. While on these ranges, as well as on other occasions, the absence of mountain limestone and mica slate in our primitive rocks struck me as a very remarkable fact, in some measure accounting for the scarcity of precious stones in our plutonic rocks.

III. *Fish*.—In the spring months the Goulburn is too deep to afford a plentiful supply of fish, but later in the season they may be obtained in large quantities. As soon as the volume of the rivers begins to diminish, the finny inhabitants leave the mud at the bottom, where they had concealed themselves for warmth, and disport themselves in the higher temperature on the surface of the water. Seven different species of fish are known by me to exist in the Murray; and five other distinct species inhabit our smaller rivers.

Of Mollusca *only four species* have as yet been found in the rivers and lakes of Victoria, viz., three varieties of univalve, and one of bivalve. It is difficult to account for this remarkable and somewhat characteristic fact; but I am inclined to think that the absence of limestone in our mountains and the long summer droughts stand in some connection with it. The Mollusca referred to are—

1.—*Lymnaea palustris* (?) of Lamarck. This shell is about one inch in length, and consists of three or four rapidly decreasing volutions, from left to right. It is diffused through all our lagoons.

2.—*Lymnaea peregra* (?) of Lamarck. The shell of this species is about three-eighths of an inch in length; the volute winds from left to right, and the colour is a dark grey. It is very plentiful in the low plains, which in winter are covered with water, but become dried up in the warm season.

3. — *Bullinus obscurus* (?) — This shell is about three-eighths of an inch in length, the convolutions winding from left to right; colour—dark yellow. It is plentiful in the numerous brackish lagoons.

4.—*Unio tumidus* (?)— This shell is very plentiful in all our rivers, and forms a considerable portion of the food of the natives during the summer season.

Frogs.—During my stay at the Goulburn in September, three species of frogs came under my observation, all very plentiful along the banks of the river.

Snakes and Lizards.—In the earlier part of October snakes and lizards become plentiful; and in the beginning of the ensuing month change their skins. They prey upon young broods of birds and animals at this season.

Black duck.—In the middle of July the sheltered places at the base of the Mount Macedon ranges become the resort of swarms of birds of every class. The natatores in particular congregate in vast flocks on the swampy plains. Conspicuous amongst these is the black duck (*Anas superciliosa*) and little teal. The wood duck (*Bernicla jubata*) is also observed in groups of three or four individuals in these immense flocks; and the gay plumage of the mountain duck (*Casarca tadarnoides*) here and there becomes visible.

Towards the latter end of July, the commencement of the breeding season, these birds separate in couples; they breed in the following month, and the young are brought forth in September.

Plover.—At this period (July and August) two varieties of plover, the alarm bird (*Lobivanellus lobatus*), and black breasted plover, (*Sarciophorus pectoralis*), gather in considerable force around Mount Macedon, on the plains, especially where the ground is honeycombed.

Blue Crane (*Ardea Novæ Hollandiæ*). — In this month the blue crane may be observed flying singly through the gullies and along the creeks. This well known bird chooses his mate in September, and evinces the most ardent attachment towards her; the female, aware of this, and desiring to raise the jealousy of her paramour, pretends not to reciprocate his affection, and continually manifests a pretended desire to desert him.

The black shag or cormorant (*Phalacrocorax carbooides*), frequents the creeks and gullies at this period, and is seldom observed in groups.

The curlew plovers (*Oedicnemus grillarius*), which gather

in groups of three or four, disturb the quiet of the night with their loud and shrill voices.

The order of Rassores is here represented by several varieties of quail. The predominating species (*Coturnix pectoralis*), frequents the high grassy ground near the banks of the creeks.

In September pigeons begin to arrive from the northern countries at our more grassy and congenial plains.

The absence of the woodpeckers in Australia is rather remarkable, as they are universally distributed over the whole world, Polynesia excepted.

The family psittaci, (order *incessores*), are not very frequently seen during the winter months, if we except two varieties of parrot, the blue mountain (*Trichoglossus Swainsonii*, and *Trichoglossus porphyrocephalus*), who are observed in the box trees, which, at the season alluded to, are beginning to blossom.

Cockatoo.—At the commencement of the sowing season the white cockatoos, (*Cacatua galerita*), concentrate in large flocks in the agricultural districts, and cause much annoyance to the farmers.

The gang gang cockatoo, or red crowned parrots, (*Callocephalon galeatum*), evince the most extraordinary attachment to each other, and which I have repeatedly had occasion to remark. If one of a group of these birds be shot, the wounded bird, clinging to the tree, cries loudly till dead; and a number of others, in sympathy for the fate of their unfortunate companion, refuse to quit the tree, and may be secured one after another.

King Parrot.—The beautiful king parrot or red lory, (*Aprosmictus scapulatus*), is far from being plentiful at Mount Macedon. It frequents the tops of gigantic eucalyptus, and is a very restless bird, continually flying from tree to tree.

Cuckoos.—Of the cuckoo I have observed a number of species. These moody birds sit motionless on the lower branches of the eucalyptus, and observe with lethargic indifference the exciting love affairs of the other inhabitants of the forest.

Magpie (*Gymnorhina organicum*).—In September the magpie chooses his mate, but invariably has many aspiring rivals to contend with.

Magpie Lark.—The magpie lark, (*Grallina Australis*), takes advantage of the contests which arise between other birds, especially the white magpie, at the commencement of the



BIRDS OF VICIORIA

V. COCKATOOS

(Head with movable crest.)



361.

Greater galangana



365.

Lesser blue-faced booby



362
Cacatua Leadbeaterii
Leadbeater's Cockatoo



375
Callecephalon galeatum
Gang Cockatoo



372
Calyptorhynchus funereus
Funeral Cockatoo

BIRDS OF VICTORIA

V. COCKATOOS.



coupling season, and dexterously plucks feathers from the excited combatants, with which to line the interior of his nest.

In September the crows (*Corvus coronoides*) concentrate in large numbers around the squatters' home stations; where they pick the skins which are there hung out to dry, and feed upon the refuse of the stations. They are very troublesome to the bullocks, by picking in the hide for insects; and I have often seen one of these animals surrounded by them, and being far too lazy to rise, maintaining a perpetual flourish of his tail, in the vain endeavour to drive them off.

In July the satin birds (*Ptilonorhynchus holosericus*) gather in multitudes in particular localities, especially round deserted sheep stations. These large flocks consist principally of females, being accompanied only by one or two males, living in polygamy. In August and September, however, these birds retire into the more secluded districts.

The white-winged chough, or black magpie (*Corcorax leucopterus*), throughout the whole year associates in groups of ten or fifteen, and frequent the dense and hilly parts of the forests. Its voice is both loud and deep, and, when roused, breaks the silence of the bush by its monotonous cries, and peals forth an alarm to all the birds and animals of the forest. Hence it is looked upon with a distrustful eye by the sportsman; and I can myself testify to the annoyance which it in this manner causes.

Squeaker.—The squeaker (*Strepera anaphonensis*) is a shy and solitary bird, living entirely on the flats, and is remarkable on account of its frequenting only the same locality. He is hence easily distinguished from the *Gymnorhina tibicen*, whose shrill and piping voice is so well known on all the high lands.

Little Kingfisher.—The little kingfisher (*Halcyon sanctus*) is plentiful along the banks of the creeks and rivers, but quickly disappears at the approach of the observer.

Laughing Jackass.—The great kingfisher (*Dacelo gigantea*) or, as it is more familiarly known, the laughing jackass, during the winter lives entirely on small fish, but in the summer months snakes and lizards form the staple of its food. It is well known to the colonists for its peculiar cry; at the first dawn of sunrise its wild laugh is heard resounding far and wide through the woods, waking up the birds and animals of

the forest. At sunset, again, his loud notes summon all nature to rest, and peal forth a last good night to all.

Friar Bird.—The *Tropidorhynchus corniculatis* is well known to the colonists by the names “poor soldier,” “leather-headed jackass,” “friar bird,” &c., &c. This curious bird, in common with several other varieties of honey-eaters, is remarkable on account of its extreme liveliness, and the singular resemblance of its notes to the human voice, which is a source of much amusement to ladies residing in the bush, and who are sometimes inclined to maintain that the bird possesses the power of verbally expressing its emotions.

Flycatchers, &c.—The flycatchers, robins, and finches, are plentiful along the banks of the creeks and rivers, and in the neighbourhood of huts or villages.

Of the hawk tribe Australia contains but few distinct families, but the number of species is exceedingly large; about thirty-seven.

Eagle.—In the mountainous districts, the eagle (*Aquila fucosa*), is numerous, and may be observed wheeling majestically through the air, at an immense altitude, scanning the earth with a greedy and rapacious eye, and anticipatory of a luxuriant repast on the carcasses of scabby sheep which strew the plains, and which, indeed, are sufficiently numerous to satisfy the appetite of the whole tribe.

Six hundred species of birds have already been discovered in Australia, and about half of these, viz. 300, are inhabitants of Victoria. In the National Museum are about 230 species (with an equal number of duplicates), and when we consider that the institution has been scarcely eight months in existence, we have no reason to be ashamed of the progress made when a comparison is drawn with the museums of our sister colonies.

Animals.—Of mammalia Australia possesses but very few orders; the marsupial division is however developed to its fullest extent, more so than in any other portion of the globe, being in fact characteristic of this continent.

Of the *chelopoda* we have only one representative, the dingo or wild dog, of which there are three species.

Marsupials.—The first of the marsupial order of animals was discovered in America, and the astonishment which pervaded the ranks of scientific men upon the occasion was still more heightened when it was made known, that in a far

more distant part of the globe, the marsupiala were developed to their fullest extent. "Australia," says Waterhouse, "is the great metropolis of these animals," upwards of seventy species having been already discovered in that vast territory.

This division of the animal kingdom is marked with characteristics, of so peculiar and remarkable a nature as to render them of the highest interest to the zoologist; I allude to the pouch and to the marsupial bones. The latter perhaps are not so well known to the general public as the more obvious characteristic of the female pouch. Another point of unusual interest in the marsupiala is the manner in which the young are born. The embryo, at the time of its birth, is so little advanced when compared with the young of other animals, that many naturalists, in order to explain the difficulty of so imperfect a creature reaching the pouch, have started the opinion that it is born through the teat and not through the uterus, in the usual way; but this hypothesis is now almost entirely abandoned, and it is pretty generally received that the young marsupial is conveyed to the pouch by the mother, and carefully placed on the teat, where it remains till it has attained a considerable size. It is a curious and remarkable provision of nature that the young animal obtains the power of vision, so soon as its increasing weight has disengaged it from the teat, although it lives entirely in the pouch a considerable time after the commencement of this, its secondary period of existence. It is not however till the third period that the skin becomes covered with fur, and the animal obtains its full sight; it then quits the pouch, but upon the least approach of danger is received into it.

The class reptantia is represented in Australia by the *ornithorychus rufus* or *paradoxus* (*platypus anatinus* of Shaw), and the *echidna histryx* or porcupine anteater of the colonists.

Platypus.—In the first colonisation of Australia both these animals was regarded with so much interest as to elicit the most minute description from every naturalist who visited that vast continent, and rendering later investigations respecting them in some measure superfluous. My observations in this quarter are therefore both few and limited; and though I have had many opportunities for investigations of this nature, I have thought proper to confine myself to those of which less is known. The heel of the platypus is furnished with a large pointed spur, said to be moveable, and which in the male animal is hollow. The object for which nature

provides this appanage is at present unknown, though I am inclined to think that it is intended as a means of defence against attack. Be this as it may, however, the natives entertain a strong prejudice against touching a platypus, though they are not ready to state the reason of their apprehensions.

These animals frequent the quiet waterholes of the creeks and rivers, and are easily detected in the water by the circles and eddies which are formed around them. "On the slightest alarm," says Waterhouse, "they instantly disappear, and indeed they seldom remain longer on the surface than one or two minutes, but dive head foremost with an audible splash, re-appearing, if not alarmed, a short distance from the spot at which they dived. Their action is so rapid, and their sense of danger so lively, that the mere act of levelling the gun is sufficient to cause their instant disappearance; and it is, consequently, only by watching them when diving, and levelling the piece in a direction towards the spot at which they seem likely to re-appear, that a fair shot at them can be obtained. A near shot is absolutely requisite; and when wounded they usually sink immediately, but quickly re-appear on the surface." The burrows which the platypus makes are very extensive, from twenty to fifty feet in length; its entrance is invariably close to the water's edge, and its other extremity terminates in a capacious chamber, sufficiently large for the residence both of the adults and young.

Porcupine.—This extraordinary animal, which somewhat resembles a hedgehog, but like the platypus is distinguished by a long and slender bill, like that of a duck, is nowhere observable during the winter months, but makes its appearance on the higher ranges in September. The skin of the porcupine is double, the outer one being covered with the fur, while the pines are inserted in the lower skin, which is very muscular and fully half an inch thick. Between this and the flesh is a layer of fat. Like the platypus, the hind foot of the echidna is provided with a powerful horny spur, evidently intended by nature as a weapon of defence. The facility and the rapidity with which this animal burrows is truly astonishing, its powerful claws, beak-like snout, and even the spines of its back being brought into requisition. Flinders relates that his dogs having discovered a porcupine anteater were quite unable to produce any impression upon it, and he escaped, "by burrowing in the loose sand—not head foremost, but by sinking himself directly downwards;

and thus presenting nothing but his prickly back to his adversaries." The body of the animal, when burrowing, is contracted into a minimum space, and the loose earth thrown backwards, the whole of its spiny back thus becoming gradually covered, till, by suddenly expanding its quills, it is thrown off. An echidna being placed in a large chest of earth containing plants, the animal arrived at the bottom in less than two minutes, (*vide* Quoy and Gaimard). I kept two living specimens on a tether rope for a considerable length of time, with the intention of bringing them to Melbourne alive, but unfavorable circumstances compelled me to kill them, and content myself with securing the skins alone.

Many naturalists make the platypus and echidna the representatives of a new order. Both these animals possess the *ossa marsupiala*, though no traces of a pouch are at all discoverable, whence it appears to me that they cannot with propriety be classed with the marsupials. "The platypus," says Waterhouse, "is decidedly the lowest of the mammalia yet discovered; and both it and the echidna, in many of their anatomical characters, evince a considerable approach towards the class reptilia. The latter animal, too, is known to possess a power of fasting which had hitherto been ascribed only to reptiles, and becomes dormant when exposed to any considerable degree of cold.

Prenziculantia.—Of this order, only one species, viz.:—the *Hydromis* is at present known to me.

Incredible numbers of water rats (*Hydromis leucogaster*) frequent the lagoons of the Goulburn during the spring months. These animals are remarkable for their sharp sight, and the mode in which they swim: the whole body, with the exception of the extremities of the nose and tail, being immersed. Their extreme vigilance renders them very difficult to be obtained, the least movement being sufficient to cause their instant disappearance; hence it is only by a series of close observations that the beholder is apprised of their great numbers.

Wombat.—This clumsy, but well known, animal (*Phascolomys wombat*) during the day conceals himself in his gloomy lair in the loneliest recesses of the mountains, and usually on the banks of a creek, and at night roams about in search of food, which it finds by grubbing about the roots of gigantic eucalypti. Thus protected by the darkness and the dense forest, but few opportunities occur to the naturalist of making close observation of its habits, which accounts for

the scarcity of information on this subject, in books treating on the Zoology of Australia. Their capture is also attended with a very considerable degree of difficulty, so much so that the utmost exertions of three or four men for several days are insufficient to effect it. As an illustration of this, I subjoin the following extract from my diary, showing the mode which the natives pursue in endeavoring to effect its capture.

Sept. 10, 1854.—The aborigines, Sandy and Mackenzie, searching the banks of the creek for wombats; and succeeding in tracking one to a hole, the opening of which was then carefully obstructed.

11th.—Sandy and Mackenzie again repaired to the hole, which, having been cleared of the logs placed before it, was entered by Sandy; the other remaining above, listening attentively to the knocking of his companion below, indicative of the situation of the animal. This spot is carefully marked on the surface, and the native having come out, the hole is again blocked.

12th.—The three natives sunk a shaft on the spot, which had been ascertained by them yesterday, and bottomed it at a depth of twenty-two feet. Found, to their astonishment, that the animal had disappeared, and left the work for the day; the opening, as before, being carefully obstructed.

13th.—The natives almost exhausted, so myself and assistant began to dig for the wombat, and sunk a new shaft of seventeen feet; but on bottoming it, had the mortification to discover that the animal had again disappeared. Here we lost all traces of him, the natives being equally at fault; and at length gave up the search.

The flesh of the wombat is by the natives esteemed as a great delicacy. The taste when roasted is not unlike that of veal; as I have on several occasions, owing to a scarcity of provisions, been obliged to avail myself of it.

I could never induce a native to skin a wombat, and after considerable inquiry as to the cause assigned for this refusal, I was enabled to ascertain that it was owing to a supposed pernicious effect which it had upon the bones of the hand. Whether the fat of the animal in a raw state may not exert some influence on the phosphorus of the bone, I leave it for others to decide.

Koala.—The koala or karbor (*Phascolarctos cinereus*) frequents very high trees, and sits in places where it is most sheltered by the branches, hence it is with difficulty detected, especially as its fur is of the same colour as the bark of the

tree on which it sits. This remarkable animal, like the cat, has the power of contracting and expanding the pupil of the eye. Its skin is remarkably thick, and the back is covered with dense woolly fur. It is very difficult to skin, and the natives regard it with the same superstition as the wombat, already mentioned. The male has a gland on the breast which emits a very strong and offensive odour. The koala uses the two first toes on the fore paws jointly for the thumb; it is a very inactive animal, being known to remain several days on the highest branch of a tree, without any other motion than that of drawing the branches to it, on the leaves of which it feeds. Even when shot it merely shrinks at the report of the gun, but in nowise offers to move. The natives aver that the koala never drinks water, and from the insufficiency of opposite testimony on this point, it is highly probable that such is the case; as I have myself kept one alive for three weeks without being able to induce it to drink. When thus placed in confinement, it barks in a melancholy tone during the night, like a dog.

In September the young koala is in the last period of dependency upon its parent, and may be observed sitting on the back of the mother.

Halmaturini (Kangaroos).—During my travels in Victoria I have met with seven distinct species of kangaroo; but insufficiency of leisure time has prevented me from making those observations which I otherwise should have desired, and I add only a few remarks concerning those varieties which are the most common.

1. *Halmaturus gigantea*.—This species, so well known to the colonists by the names of forester, old man, boomer, &c., has now entirely disappeared from the neighbourhood of Mount Macedon, a locality in which it was formerly exceedingly plentiful. The Black Ranges, however, on the Goulburn, are yet inhabited by considerable numbers of these animals.

The Wallaby (Macropus nalabatus) is plentiful in the lonely passes of Mount Macedon; but the amazing rapidity with which it retreats into the dense scrub, at the least signal of alarm, renders it of very difficult capture, unless the sportsman be well provided with good dogs trained to the chase.

Hypsiprymnus (Kangaroo rat).—Two species of this animal have come under my notice, viz., the common variety, with the white-pointed tail; and a new species, the tail of which is completely destitute of fur.

Dasyurini.—This order is divided into two great branches: the first group contains the bandicoot (*Perameles nasutus*) and the bush rat (*P. Gunnii*).

Both these animals are extremely plentiful throughout the whole colony; in the summer they frequent the plains, whence they are driven by the heavy winter rains, and forced to take refuge in the higher lands. They are not fitted to ascend trees, and being thus confined to the ground and surrounded by enemies, including bush fires, can never become more numerous than they are at present.

To the other divisions of *dasyurini* belong the tiger cat, (*dasyurus maculatus*), and the native cat, (*Dasyurus viverrinus*), of which there are two varieties.

The Tiger Cat though its dimensions are not sufficiently great to invest it with a formidable appearance, is nevertheless a most ferocious and blood-thirsty little animal. Of late years, however, it has become very scarce, so that it is with difficulty obtained at the present time. During a stay of two months on and around Mount Macedon I was only enabled to procure one specimen.

Native Cat.—Of the *Dasyurus viverrinus* or native cat there are two varieties, as has been mentioned, viz., the *alba niger* and *alba castarea*. These little animals are extremely courageous when attacked; and are very plentiful around sheep stations, where the settlers use every means for exterminating them. There are now large numbers of them in localities where, before the intrusion of the European, they were extremely rare; in short, their numbers have augmented in proportion as those of the dingo have diminished, in accordance with that inscrutable law of nature which regulates the equilibrium of animal life.

The Rabbit Rat. (—?)—This little animal is well known to hutkeepers and to residents in the bush, on account of its prying and inquisitive propensities, and the fondness which it appears to possess for sugar and other stores.

Phalangistæ.—The phalangiers, *i. e.* the balantia of *Heiger*, contains the two great genera, the flying squirrel (*Petaurii*), and opossums (*Didelphis*).

Of the former, I have observed in Victoria six different species, but on account of insufficiency of leisure time, I am unavoidably prevented from making those observations which I should under other circumstances have desired.

The common flying squirrel (*Petaurus scuirens*) is very plentiful in the large gum trees near the banks of a creek or